

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
15 January 2004 (15.01.2004)

PCT

(10) International Publication Number  
WO 2004/006350 A3

(51) International Patent Classification<sup>7</sup>: H01L 27/32, 27/30

(74) Agent: SHADE, Matthew; Cambridge Display Technology Limited, Greenwich House, Madingley Rise, Madingley Road, Cambridge, Cambridgeshire CB3 0TX (GB).

(21) International Application Number:

PCT/GB2003/002734

(22) International Filing Date: 26 June 2003 (26.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0215309.6 3 July 2002 (03.07.2002) GB

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (for all designated States except US): CAMBRIDGE DISPLAY TECHNOLOGY LIMITED [GB/GB]; IP Department, Greenwich House, Madingley Road, Madingley Rise, Cambridge, Cambridgeshire CB3 0TX (GB).

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

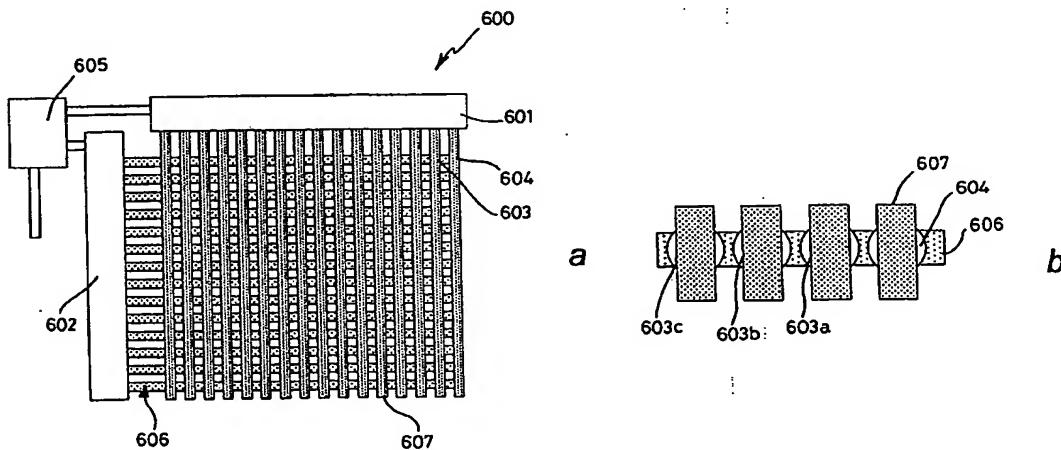
(75) Inventors/Applicants (for US only): HALLS, Jonathan [GB/GB]; Cambridge Display Technology Limited, Greenwich House, Madingley Rise, Madingley Road, Cambridge, Cambridgeshire CB3 0TX (GB). SHADE, Matthew [GB/GB]; Cambridge Display Technology Limited, Greenwich House, Madingley Rise, Madingley Road, Cambridge, Cambridgeshire CB3 0TX (GB).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: COMBINED INFORMATION DISPLAY AND INFORMATION INPUT DEVICE



WO 2004/006350 A3

(57) Abstract: A combined information display and information input device comprising a matrix of independently addressable light emitting devices and a plurality of light sensing devices, the light emitting devices comprising organic light emitting diodes comprising organic light emitting material positioned between a low work function electrode and a high work function electrode characterised in that the light sensing devices comprise organic photovoltaic devices comprising at least an organic electron donor and at least an organic electron acceptor positioned between a high work function electrode and a low work function electrode. The combined information display and information input device has application as a touch screen, for example for a mobile communication device.



(88) Date of publication of the international search report:  
8 April 2004

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 03/02734

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H01L27/32 H01L27/30

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/079512 A1 (KOYAMA JUN ET AL) 27 June 2002 (2002-06-27)	1,2,4,7, 8,11,12, 18,20, 21,25, 27-48
Y	figures 4,4 paragraph '0034! – paragraph '0048!  paragraph '0228! – paragraph '0232! paragraph '0372! – paragraph '0388! ---	3,5,6,9, 10, 13-15, 22-24, 49-53

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

### Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

3 February 2004

10/02/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.  
Fax: (+31-70) 340-3016

Authorized officer

Visscher, E

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/02734

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 99 49525 A (PETRITSCH KLAUS ;CAMBRIDGE DISPLAY TECH (GB); GRANSTROM MAGNUS (GB) 30 September 1999 (1999-09-30) cited in the application figure 5 page 8, paragraph 1 -page 9, paragraph 4	3,5,6,9, 10
Y	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 05, 14 September 2000 (2000-09-14) -& JP 2000 058942 A (FUTABA CORP), 25 February 2000 (2000-02-25) abstract	13-15
Y	EP 0 822 603 A (EASTMAN KODAK CO) 4 February 1998 (1998-02-04) figure 1 column 3, paragraph 3 column 4, paragraph 2	22-24
Y	EP 1 058 314 A (SEMICONDUCTOR ENERGY LAB) 6 December 2000 (2000-12-06) figure 11 paragraph '0186! - paragraph '0191!	49-53
A	EP 0 969 701 A..(SEIKO EPSON CORP.) 5 January 2000 (2000-01-05) cited in the application figures 1-5 paragraph '0023! - paragraph '0024!	46-53

# INTERNATIONAL SEARCH REPORT

Information on patent family members					International Application No PCT/GB 03/02734
Patent document cited in search report	Publication date	Patent family member(s)		Publication date	
US 2002079512	A1	27-06-2002	JP 2002287900 A		04-10-2002
WO 9949525	A	30-09-1999	AU 2433799 A CN 1298554 T EP 1064686 A1 WO 9949525 A1 JP 2002508599 T TW 471183 B US 6340789 B1		18-10-1999 06-06-2001 03-01-2001 30-09-1999 19-03-2002 01-01-2002 22-01-2002
JP 2000058942	A	25-02-2000	NONE		
EP 0822603	A	04-02-1998	US 5776622 A EP 0822603 A2 JP 10074586 A		07-07-1998 04-02-1998 17-03-1998
EP 1058314	A	06-12-2000	CN 1284694 A EP 1058314 A2 JP 2001052864 A TW 447145 B		21-02-2001 06-12-2000 23-02-2001 21-07-2001
EP 0969701	A	05-01-2000	JP 11087063 A EP 0969701 A1 US 6388377 B1 CN 1237318 T WO 9912397 A1 TW 406520 B US 2002079833 A1		30-03-1999 05-01-2000 14-05-2002 01-12-1999 11-03-1999 21-09-2000 27-06-2002